

AMENDMENTS TO THE DRAWINGS

Figure 2 is amended to correct two reference numbers and to conform Figure 2 to the specification.

Attachment: Replacement Sheet(s)

REMARKS/ARGUMENTS

In response to the Office Action mailed May 4, 2005, Applicant amends his application and requests reconsideration. In this Amendment claim 1 is cancelled and claims 6-10 are added so that claims 2-10 are now pending.

In view of the submission of new and amended claims, the title of the patent application is amended to conform to the new and amended claims.

The Examiner noted that Figure 2 did not conform to the disclosure of the patent application with regard to two reference numbers. An amended Figure 2 is attached, correcting the error and omission.

Applicant confirms that, in response to the species election requirement, the alleged species of Figures 1-7 was elected. Accordingly, claim 5 was withdrawn from consideration. However, claim 1 was acknowledged to be generic. In this Amendment, generic claim 1 is replaced by generic claim 6, the only pending independent claim. In addition, new claims 7-10 are supplied. Some of those added claims are generic, some pertain to the alleged species of Figures 1-7, and others pertain to the alleged species of Figures 8 and 9. Upon the allowance of claim 6, a generic claim, claim 5 and all of the dependent claims should be joined to the prosecution and allowed pursuant to 37 CFR 1.141.

In view of some complicated language of original claim 1, a new generic claim 6 is presented. That claim is clearly supported by the application as filed and encompasses, as already noted, both alleged species of the invention that are disclosed in the present patent application. In the first species encompassing Figures 1-7, the land has a structure illustrated in Figures 1, 4, and 7. That land includes two arcuate edges that are part of the circumference of a circle and two linear edges that join the two arcuate edges. In terms of the claims, the arcuate edges comprise boundaries of the pair of first portions of the land and the linear portions comprise boundaries of the pair of second portions of the land. Amended claim 2 describes these linear and arcuate edges of the land and clearly pertains to the first identified species of the invention. Claim 3, although indicated as allowable as examined, is amended, in view of the cancellation of claim 1, to depend from claim 2. Amended claim 3 pertains to the alleged first species. Claim 4 is amended for consistency with new claim 6 and is clearly generic as depending from a generic claim and encompassing both alleged species.

Although claim 5 was withdrawn from examination, that claim is amended to be consistent with new claim 6 from which claim 5 depends. That claim 5 is amended with the expectation that it will be rejoined to the prosecution. Claim 5 encompasses the alleged second species of the invention. Claim 7, a new dependent claim, describes the edges of the pairs of both the first and second portions of the land as arcuate and therefore is supported by Figure 8 of the patent application and relates to the alleged second species. Claim 8 further describes the existence of multiple pairs of first and second portions of the land, depends from claim 7, is supported by Figure 8, and thereby pertains to the alleged second species of the invention. Claims 9 and 10 both depend from generic dependent claim 5. Claim 9 describes the arrangement of ground through-holes relative to the land in the arrangement of Figure 8 whereas claim 10 describes that arrangement with regard to the embodiment of Figures 1, 4, and 7. Thus, claim 9 pertains to the alleged second species whereas claim 10 pertains to the alleged first species of the invention.

As explained in the patent application, an important feature of the invention is the shape of the land on the signal layer. By controlling the shape of the land and its arrangement with respect to the ground through-holes, the effective capacitance of the land can be reduced so that the claimed multi-layer wiring board can be useful at higher frequencies than a wiring board with circular lands. In other words, a wiring board according to the invention has an extended useful frequency range, particularly at frequencies in the Gigahertz range.

Examined claims 1-4 were rejected as obvious over Kistner (U.S. Patent 6,828,513) in view of Darveaux et al. (U.S. Patent 6,201,305, hereinafter Darveaux). This rejection is respectfully traversed, particularly as to the claims now pending.

The most fundamental requirement for establishing *prima facie* obviousness is that all of the elements of the claimed invention must be found in one of the multiple references applied in the rejection. Of course, even if all of the elements of the claimed invention are found in different prior art publications, motivation for the combination of those elements as in the invention must be shown to establish *prima facie* obviousness. Here, the initial requirement for establishing *prima facie* obviousness has not been established because at least one element of the invention, particularly as defined by independent claim 6, is missing from both Kistner and Darveaux.

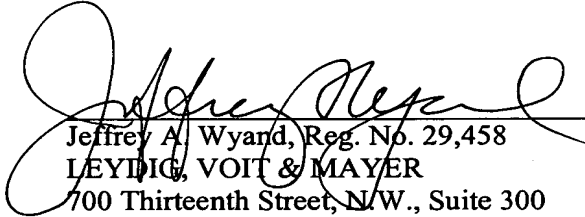
As described above, a particularly important feature of the invention is the shape of the land of the signal layer. That land includes four portions, a pair of first portions extending from opposite side of the signal through-hole and defining a first, larger width of the land. The pair of second portions, like the first portions, extending from opposite parts of the signal through-hole, defines a second width. Both the first and second widths are measured along respective diameters of the signal through-hole. The second width is shorter than the first width. A line drawn from the center of the ground through-hole that is closest to the signal through-hole lies along the second diameter of the signal through-hole, i.e., the line along which the pair of second portions, defining the second width of the land, extends. In other words, along that line extending between the center of the ground through-hole closest to the signal through-hole, the land has the smaller of the first and second widths.

In citing Kistner, the Examiner directed attention to Figures 4 and 8. In those figures, and in the other figures of Kistner, when a line is drawn between the center of any of the four illustrated ground through-holes and the center of the signal through-hole, element 808 in Figure 8 of Kistner, for example, it is apparent that that line passes through the wider part of the land, element 802 in Figure 8 of Kistner. By contrast, in the invention, as described in examined claim 1 and as is described in new claim 6, that hypothetical line passes through the smaller width part of the land. In other words, it appears that Kistner shows a structure that is the reverse of the invention with regard to the relationship between the nearest ground through-hole and the wider and narrower parts of the land. Applicant's understanding of the interpretation of Kistner is enhanced by the reproduction of Figure 8 of Kistner helpfully attached to the Office Action. It appears that there may have been a misunderstanding or misinterpretation with regard to the complex language of claim 1. Claim 6 is submitted as a substitute for claim 1 partly in view of the complexity of examined claim 1 and to make clearer what is claimed.

Darveaux was cited with respect to its Figure 3A as disclosing contact pads for spheres of solder. Darveaux was apparently intended to show that contact pads with different configurations can be prepared. However, there is no teaching within Darveaux concerning through-holes in any particular relationship between the geometry of signal through-holes and nearest ground through-holes in a multilayer wiring structure. In other words, Darveaux does not supply information sufficient to modify Kistner to produce the invention as defined by the claims now pending.

For the foregoing reasons, Claim 6 is allowable over the prior art of record. Therefore, that claim and all of its dependent claims, claims 2-5 and 7-10, should be allowed without regard to the species election requirement and consequent election. Prompt and favorable action is earnestly solicited.

Respectfully submitted,


Jeffrey A. Wyand, Reg. No. 29,458
LEYDIG, VOIT & MAYER
700 Thirteenth Street, N.W., Suite 300
Washington, DC 20005-3960
(202) 737-6770 (telephone)
(202) 737-6776 (facsimile)

Date:  July 19, 2005

Amendment or ROA - Regular (Revised 4-18-05)